

# ONKYO® SERVICE MANUAL

## AM/FM STEREO TUNER

### MODEL T-05



**ONKYO**  
AUDIO COMPONENTS

## SPECIFICATIONS

### D/W model

#### FM Section

Tuning Range:	88 – 108 MHz
Usable Sensitivity:	Mono: 11.2 dBf, 2 $\mu$ V Stereo: 17.2 dBf, 4 $\mu$ V
50 dB Quieting Sensitivity:	Mono: 18.3 dBf, 4.5 $\mu$ V Stereo: 39.2 dBf, 50 $\mu$ V
Capture Ratio:	1.5 dB
Image Rejection Ratio:	35 dB
IF Rejection Ratio:	80 dB
Signal-to-Noise Ratio:	Mono: 70 dB Stereo: 63 dB
Alternate Channel Att.:	55 dB IHF ( $\pm$ 400 kHz)
AM Suppression Ratio:	50 dB
Harmonic Distortion:	Mono: 0.15% Stereo: 0.4%
Stereo Separation:	40 dB at 1 kHz 30 dB at 100 – 10,000 Hz
Muting Level:	17.2 dBf, 4 $\mu$ V
Frequency Response:	40 – 15,000 Hz $\pm$ 1.5 dB

#### AM Section

Tuning Range:	530 – 1,620 kHz
Usable Sensitivity:	25 $\mu$ V
Image Rejection Ratio:	40 dB
IF Rejection Ratio:	30 dB
Signal-to-Noise Ratio:	40 dB
Harmonic Distortion:	0.8%

#### General

Power Supply Rating:	AC 120 V, 60 Hz (D model) AC 120/220 V, 50/60 Hz (W model)
Output Voltage:	FM: 500 mV AM: 150 mV
Antennas:	FM: 300 ohms balanced and 75 ohms unbalanced AM: built-in loop antenna and external terminal
Semiconductors:	1 FET, 3 ICs, 4 transistors, 5 diodes, 7 LEDs
Dimensions:	418(W) x 72(H) x 286(D) mm 16-1/2" x 2-7/8" x 11-1/4"
Weight:	2.9 kg (6.4 lbs.)

Due to further product improvements, specifications are subject to change without notice.

### G/Q model

#### FM Section

Tuning Range:	87.5 – 108 MHz
Usable Sensitivity:	Mono: 2 $\mu$ V, 11.2 dBf IHF 1.8 $\mu$ V (S/N 26 dB, 40 kHz, Devi.) DIN
50 dB Quieting Sensitivity:	Mono: 4.5 $\mu$ V, 18.3 dBf Stereo: 50 $\mu$ V, 39.2 dBf
Capture Ratio:	1.5 dB
Image Rejection Ratio:	35 dB
IF Rejection Ratio:	80 dB
Signal-to-Noise Ratio:	Mono: 70 dB Stereo: 63 dB
Selectivity:	50 dB (DIN) ( $\pm$ 300 kHz, 40 kHz Devi.)
AM Suppression Ratio:	50 dB
Harmonic Distortion:	Mono: 0.15% Stereo: 0.4%
Stereo Separation:	40 dB at 1 kHz 30 dB at 100 – 10,000 Hz
Frequency Response:	40 – 15,000 Hz $\pm$ 1.5 dB

#### AM Section

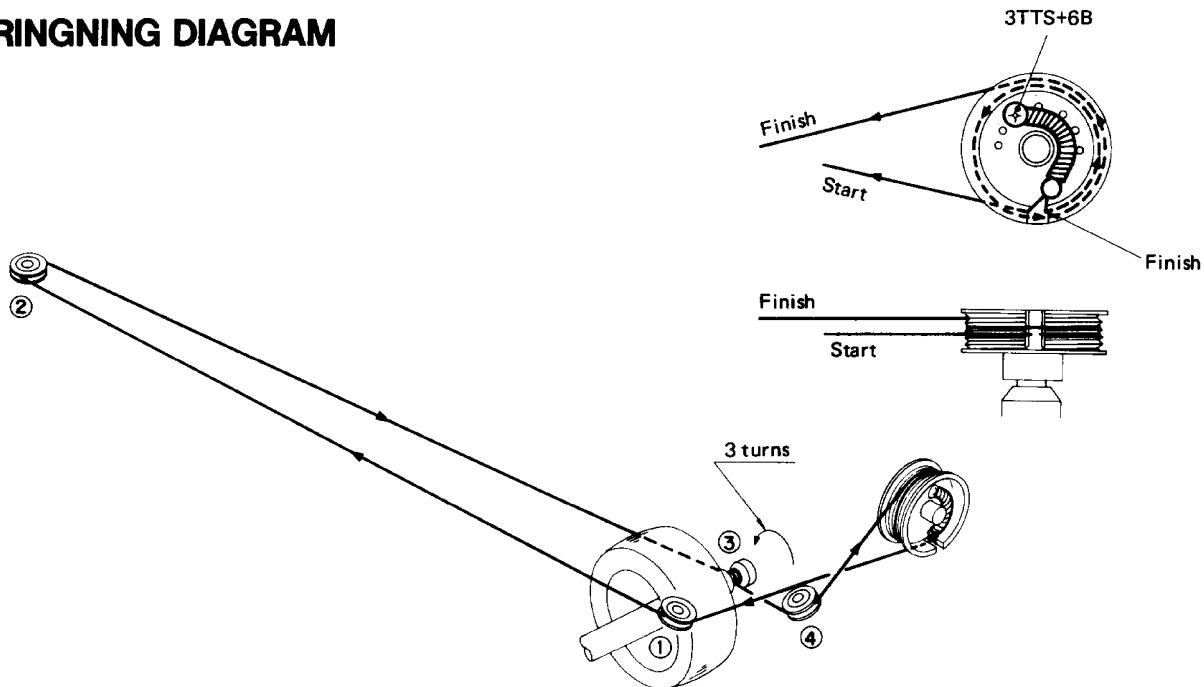
Tuning Range:	525 – 1,620 kHz
Usable Sensitivity:	25 $\mu$ V
Image Rejection Ratio:	40 dB
IF Rejection Ratio:	30 dB
Signal-to-Noise Ratio:	40 dB
Harmonic Distortion:	0.8%

#### General

Output voltage:	FM: 600 mV AM: 150 mV
Antennas:	FM: 300 ohms balanced and 75 ohms unbalanced. AM: built-in loop antenna and external terminal
Semiconductors:	1 FET, 3 ICs, 5 transistors, 5 diodes, 7 LEDs.
Dimensions:	418(W) x 72(H) x 286(D) mm 16-1/2" x 2-7/8" x 11-1/4"
Weight:	2.9 kg (6.4 lbs.)
Power supply:	European models: AC 220 V, 50 Hz British & Australian models: AC 240 V, 50 Hz

Due to further product improvements, specifications are subject to change without notice.

## STRINGNING DIAGRAM



1. Close the variable capacitor complete and tie the dial cord to the spring of the drum.
2. Thread the dial cord in the direction of arrow from ① to ③ and wind the dial cord three turns around the tuning shaft counter clockwise.
3. Thread the dial cord to ④.
4. Wind the dial cord 1-1/2 turns around the dial drum.

## SERVICE GUIDE

### 1. DE-EMPHASIS SWITCH (ONLY W MODEL)

The 50  $\mu$ sec/75  $\mu$ sec selector switch employed in the W (120/220V) model is located on the bottom board. When shipped from the factory, this switch is set to the 50  $\mu$ sec position. For use in 75  $\mu$ sec regions, switch over to the 75  $\mu$ sec position.

### 2. VOLTAGE SELECTOR (REAR PANEL)

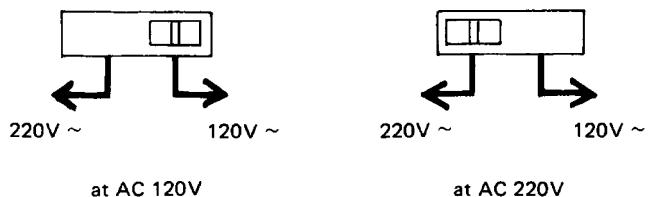
Some models are equipped with a voltage selector to conform with local power supplies.

Be sure to set this switch to match the voltage of the power supply in your area before turning the power switch on.

When changing the voltage setting, remove the lock plate covering the switch, then set the voltage to the correct value.

Voltage is changed by sliding the groove in the switch with a screwdriver to the right or left. Confirm that the switch has been moved all the way to the right or left before turning the power switch on.

If there is no voltage selector switch on the unit you have purchased, it can only be used in areas where the power supply voltage is the same as that of the unit.



### 3. DISASSEMBLY

#### Top Cover

Remove the four screws holding the top cover and side bracket.

Remove a screw holding the top cover and back panel.

#### Front Panel

Remove the top cover.

Remove the Tuning knob.

Remove the three screws holding the front panel and front bracket from the bottom side.

Remove the front panel from the nail on the front bracket.

#### Bottom Board

Remove the four screws holding the bottom board and chassis.

## ALIGNMENT PROCEDURES

### INSTRUMENTS REQUIRED

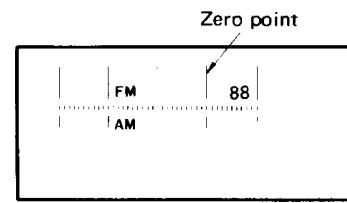
1. AM sweep generator
2. AM/FM signal generator
3. AC VTVM
4. Oscilloscope
5. Monitor scope
6. Distortion analyzer
7. Frequency counter

### GENERAL ALIGNMENT CONDITIONS

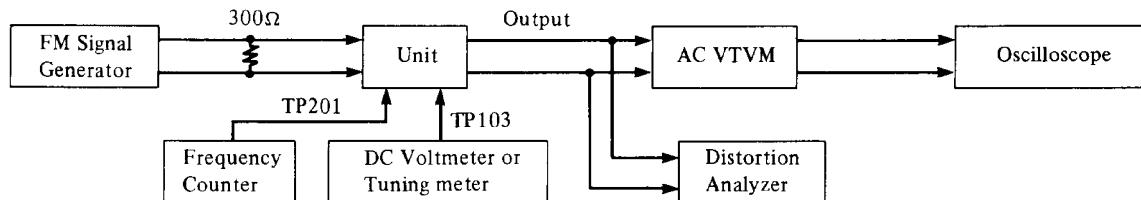
1. Signal input should be kept as low as possible.
2. Standard modulation is 400Hz 30%, (AM), 1kHz 75kHz devi. (FM MONO), pilot 6.75kHz devi. sub and main 68.25kHz devi. (FM STEREO)

#### (1) Attachment of dial pointer

1. Close the variable capacitor completely.
2. Set the radio dial pointer to zero point on dial scale and secure the stringing and pointer with the bond.



#### (2) FM ALIGNMENT

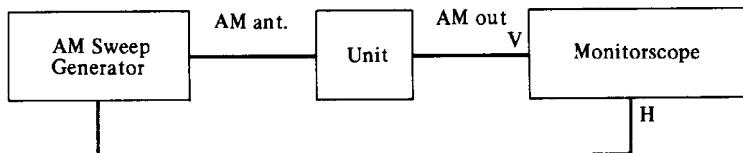


	Step	FM Signal Generator	Dial to set	Adjust	Output Indicator	Adjust for	Remarks
IF	1	No signal	Quiet Point	L101	DC Voltmeter	0V	Repeat Steps 1 and 2 as necessary
	2	98MHz 65dBf (60dB) 1kHz 75kHz devi.	98MHz	L102	Distortion Analyzer	Minimum	
Frequency range	3	87.5MHz 65dBf (60dB) 1kHz 75kHz devi.	Lower end	L004	AC VTVM or Oscilloscope	Maximum	Repeat Steps 3 and 4 as necessary
	4	108MHz 65dBf (60dB) 1kHz 75kHz devi.	108MHz	TC001		Maximum	
RF	5	90MHz 1kHz 75kHz devi.	90MHz	L001 L002	AC VTVM or Oscilloscope	Maximum	Repeat Steps 5 and 6 as necessary Signal input should be kept as low as possible. muting ... off
	6	106MHz 1kHz 75kHz devi.	106MHz	TC002 TC004		Maximum	
MPX	7	98MHz 65dBf (60dB) no mod.	98MHz	R215	Frequency counter	76kHz	

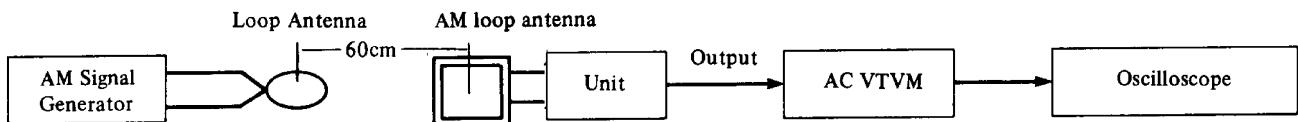
Note: When adjust the steps 5 and 6, connect the short clip between the TP102 and ground.

**(3) AM IF ALIGNMENT**

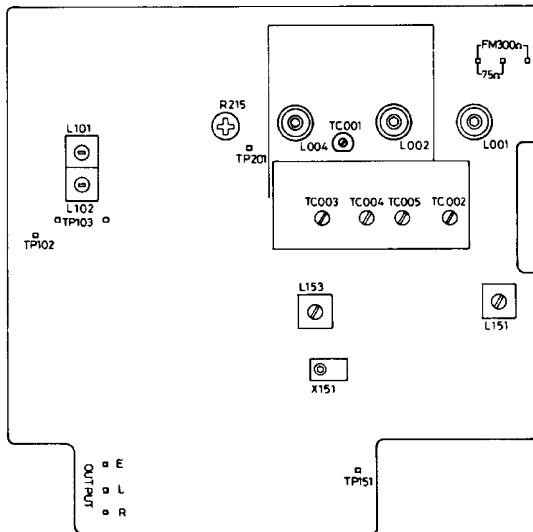
1. Set selector switch to AM.
2. Set radio dial to quiet point.



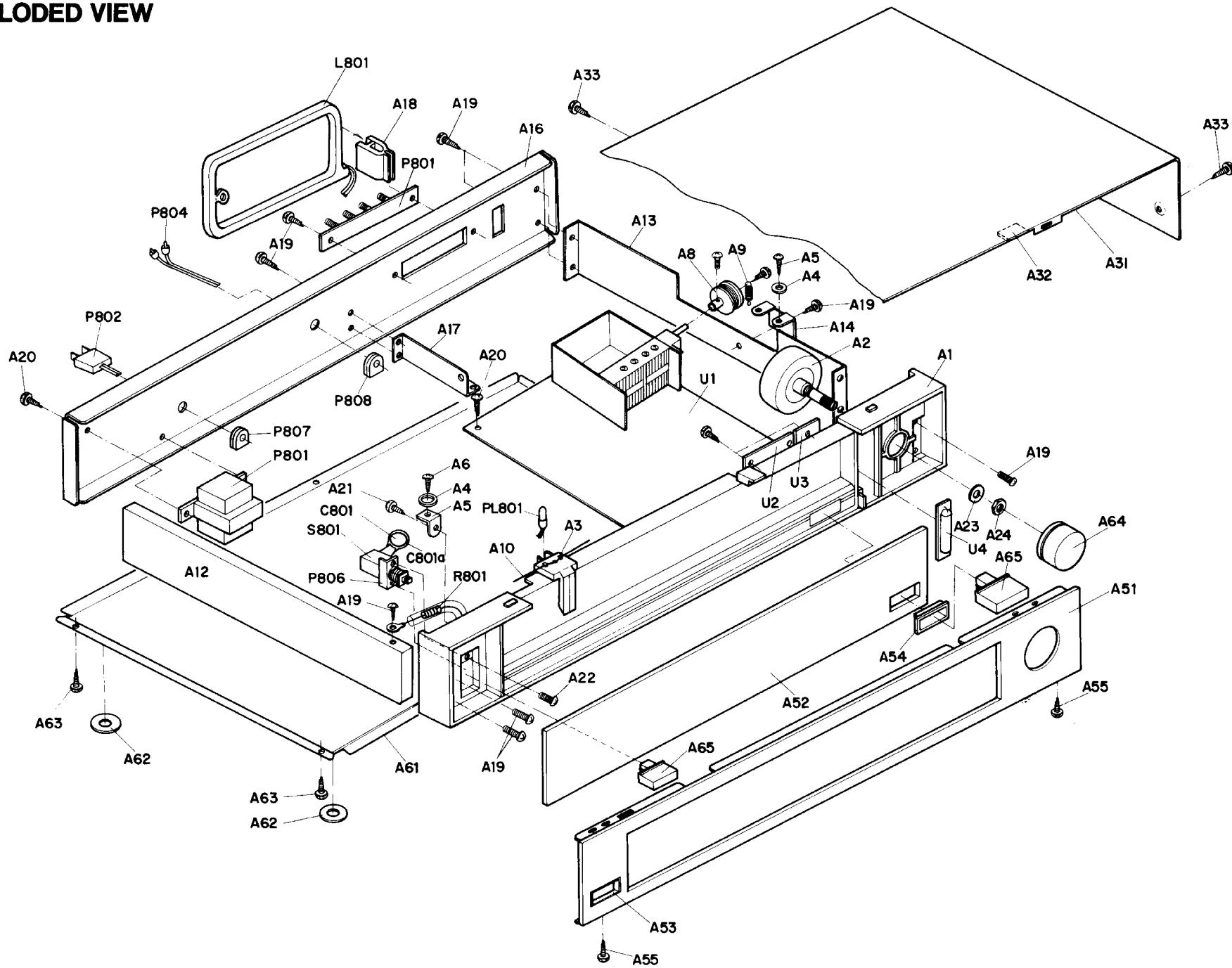
Set signal	Adjust	Monitor scope	Remarks
455 kHz	X151	Maximum Symmetrical Response	Usually not necessary to adjust

**(4) AM RF ALIGNMENT**

Step	Set Signal	Set Radio Dial	Adjust	VTVM reading	Remarks
1	515kHz 400Hz 30%	Lower end (515kHz)	L153	Maximum	Repeat steps 1 and 2 as necessary
2	1680kHz 400Hz 30%	Upper end (1680kHz)	TC003	Maximum	
3	600kHz 400Hz 30%	600kHz	L151	Maximum	Repeat steps 3 and 4 as necessary
4	1400kHz 400Hz 30%	1400kHz	TC005	Maximum	



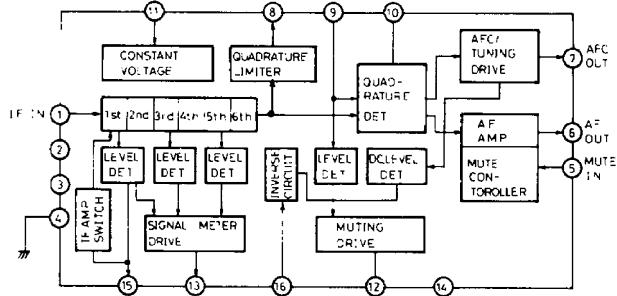
## EXPLODED VIEW



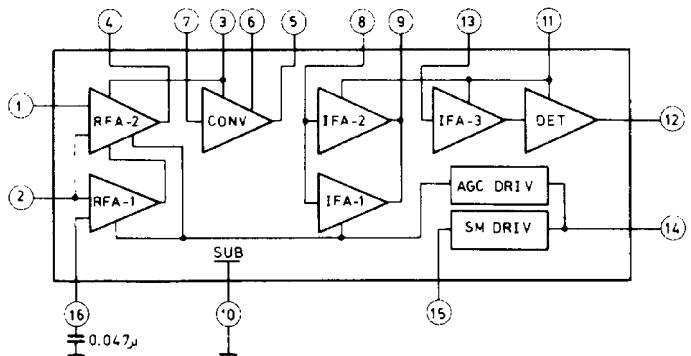
# PRINTED CIRCUIT BOARD – PARTS LIST

CIRCUIT NO.	PARTS NO.	DESCRIPTION	CIRCUIT NO.	PARTS NO.	DESCRIPTION
	<b>ICs</b>			<b>Capacitors</b>	
Q103	222595	LA1231N	VC001	3050004	NVC2-327SA, Variable
Q151	222497	LA1240	TC001	3060003	NTC-10P-02, Trimmer
Q201	222453	HA1196	C015, C114	352741009	10µF, 16V, Elect.
Q501	222541	LB1426	C105	352780339	3.3µF, 50V, Elect.
	<b>Transistors</b>		C107, C112	352784799	0.47µF, 50V, Elect.
Q001	2211815	2SK19TM (GR)	C108	352780109	1µF, 50V, Elect.
Q002, Q003	2211723	2SC1923 (O)	C153	370133614	360pF ±5%, 100V, APS
Q101	2210823	2SC1675 (L-1)	C159	352741009	10µF, 16V, Elect.
Q901	2201034 or 2201035	2SD325 (D) or 2SD325 (E)	C164	352784799	0.47µF, 50V, Elect.
	<b>Diodes</b>		C165	352744709	47µF, 16V, Elect.
D101, D151	223105 or 223133	1S1555 or DS442X	C167	352780339	3.3µF, 50V, Elect.
D152	4000001	KB269	C168	352750479	4.7µF, 25V, Elect.
D901	223862	WL01	C171	352741009	10µF, 16V, Elect.
D902	223910 or 224111	WZ120 or GZA12-L	C201	352780229	2.2µF, 50V, Elect.
	<b>L.E.Ds</b>		C207, C208	352784799	0.47µF, 50V, Elect.
D501-D504	225048	SLP-252B-04	C211, C212	352741009	10µF, 16V, Elect.
D505	225086	SEL1123R	C213	352741019	100µF, 16V, Elect.
D506, D507	225087	SEL1323G	C214	370133614	360pF ±5%, 100V, APS
	<b>Lamp</b>		C216	352780339	3.3µF, 50V, Elect.
PL101	210064B	250mA, 6.3V	C217	352780229	2.2µF, 50V, Elect.
			C218	352780109	1µF, 50V, Elect.
			C501	352741009	10µF, 16V, Elect.
			C902	352754719	470µF, 25V, Elect.
	<b>Coils &amp; transformers</b>		C903	352742219	220µF, 16V, Elect.
L001	233106 or 233088-1	NFA-3009 or NFA-3001	C904	352751019	100µF, 25V, Elect.
L002	233178	NFRF-3015			
L003	233232	NCH-1049	<b>Resistors</b>		
L004	233090	NFO-3003	R215	5225015	N10HR10KBD, Semi-fixed
L101	233148	NFIF-6010P	R501	441625604	56Ω, 1W, Metal oxide film
L102	233149	NFIF-6010S			
L103	233105 or 233024	NCH-1005 or NCH-1501	<b>Switches</b>		
L151	232086	NMA-3035	S1	25035260	NPS-142-L224, AM/FM selector
L153	232073	NMO-2008	S3	25065160	NSS-2273, DC-emphasis selector (Only W model)
L155	232041	NIT-0509			
	<b>Ceramic filters</b>		<b>Bracket</b>		
X001	3010057 or	SFE-10, 7MA5Z or	27140502	Switch	
X102	3010003	SFE10.7MA			
X151	3010053	SFL-455B	<b>Shielded plate</b>		
			27150102	Front end	
	<b>Screws</b>				
X001	3010057 or	SFE-10, 7MA5Z or	82113006	3P+6FN, Pan head screw	
X102	3010003	SFE10.7MA	831130088	3STW+8BQ, Tapping screw	
X151	3010053	SFL-455B			

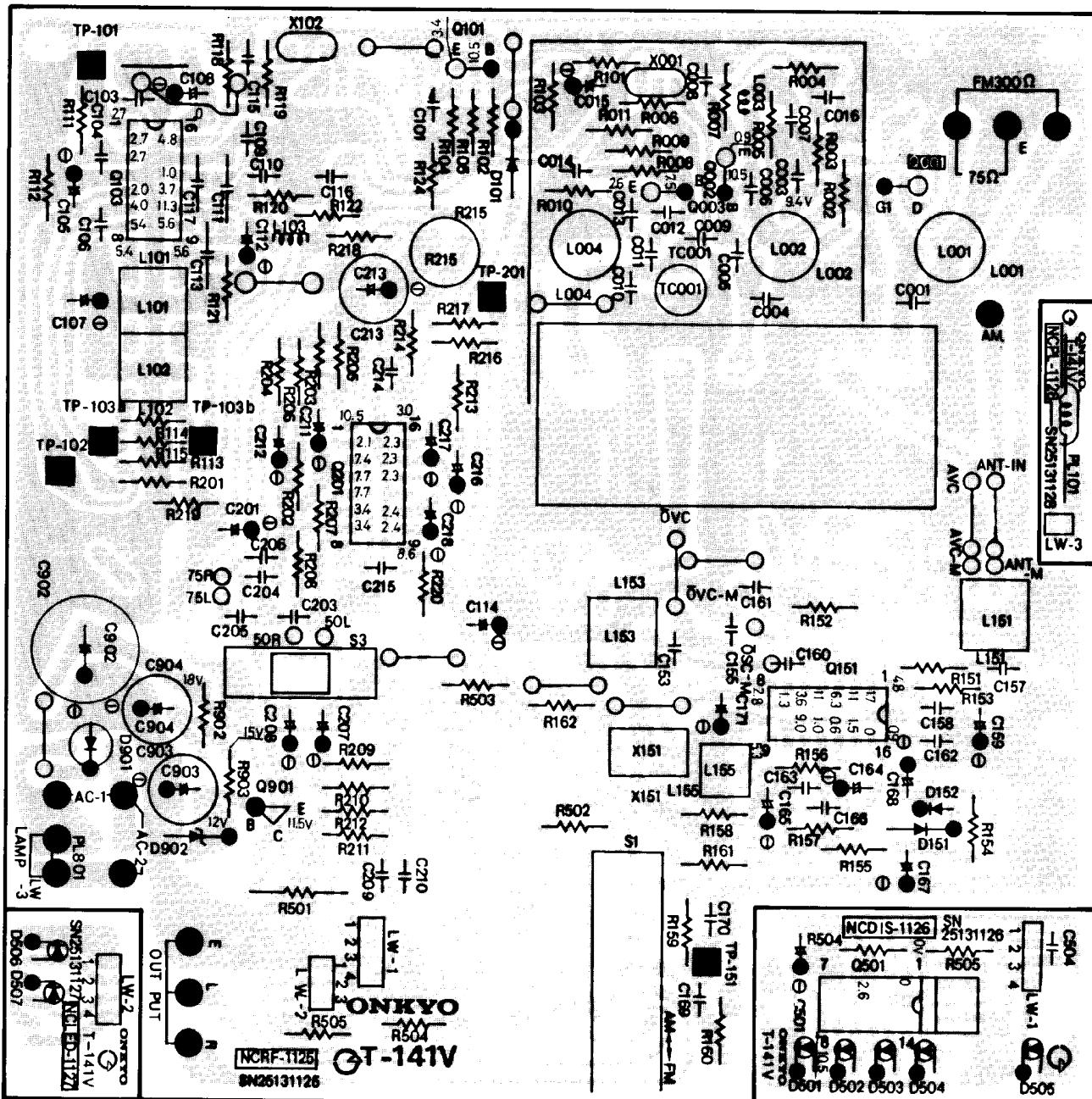
## LA 1231N (FM IF system)



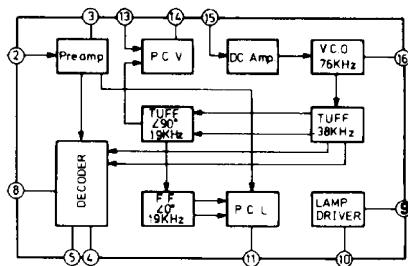
### LA-1240 (AM radio system)



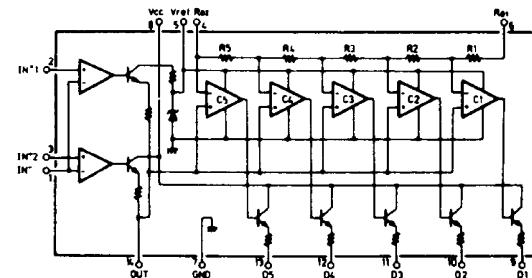
## **PRINTED CIRCUIT BOARD VIEW FROM COMPONENT SIDE D/W model**



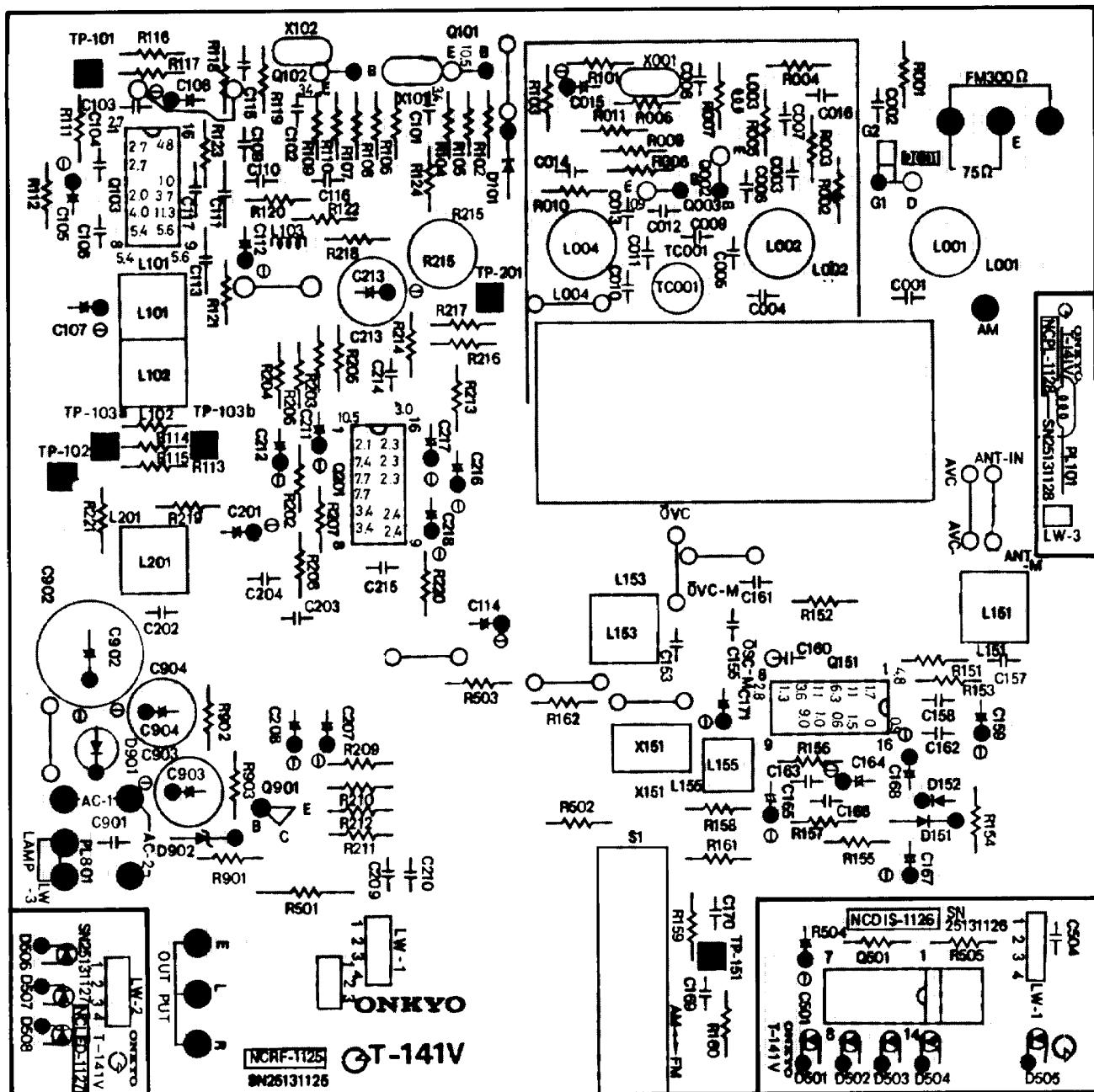
## HA 1196 (MPX decoder)



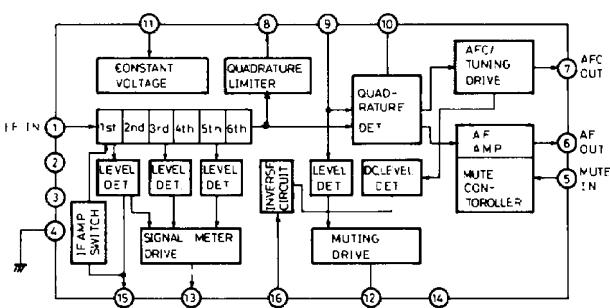
## LB1426 (Signal indicator drive)



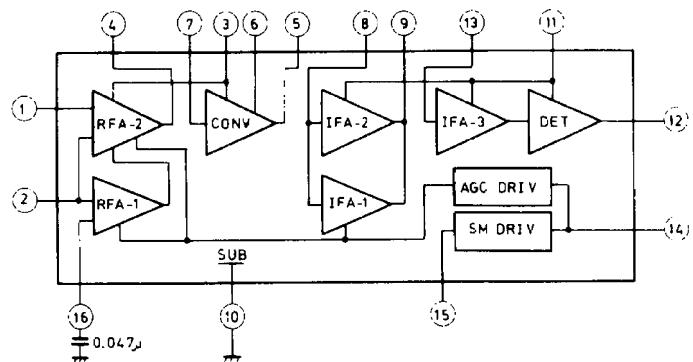
## **PRINTED CIRCUIT BOARD VIEW FROM COMPONENT SIDE G/Q model**



## LA 1231N (FM IF system)



### LA-1240 (AM radio system)

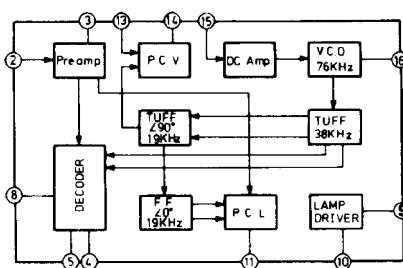


# PRINTED CIRCUIT BOARD – PARTS LIST

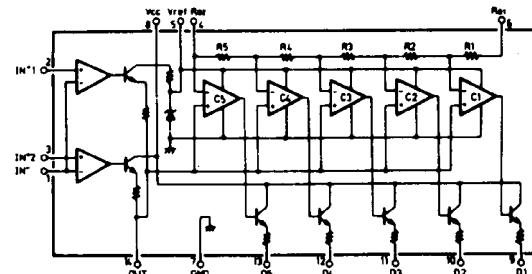
## G/Q model

CIRCUIT NO.	PARTS NO.	DESCRIPTION	CIRCUIT NO.	PARTS NO.	DESCRIPTION			
<b>ICs</b>								
Q103	222595	LA1231N	VC001	3050004	NVC2-327SA, Variable			
Q151	222497	LA1240	TC001	3060003	NTC-10P-02, Trimmer			
Q201	222453	HA1196	C015, C114	352741009	10 $\mu$ F, 16V, Elect.			
Q501	222541	LB1426	C105	352780339	3.3 $\mu$ F, 50V, Elect.			
<b>Transistors</b>								
Q001	2211713	3SK73 (GR)	C107, C112	352784799	0.47 $\mu$ F, 50V, Elect.			
Q002, Q003	2211723	2SC1923 (O)	C108	352780109	1 $\mu$ F, 50V, Elect.			
Q101, Q102	2210823	2SC1675 (L-1)	C153	370133614	360pF $\pm$ 5%, 100V, APS			
Q901	2201034 or 2201035	2SD325 (D) or 2SD325 (E)	C159	352741009	10 $\mu$ F, 16V, Elect.			
<b>Diodes</b>								
D101, D151	223105 or 223133	1S1555 or DS442X	C164	352784799	0.47 $\mu$ F, 50V, Elect.			
D152	4000001	KB269	C165	352744709	4.7 $\mu$ F, 16V, Elect.			
D901	223862	WL01	C167	352780339	3.3 $\mu$ F, 50V, Elect.			
D902	223910 or 224111	WZ120 or GZA12-L	C168	352750479	4.7 $\mu$ F, 25V, Elect.			
<b>L.E.Ds</b>								
D501–D504	225048	SLP-252B-04	C171	352741009	10 $\mu$ F, 16V, Elect.			
D505	225086	SEL1123R	C201	352780229	2.2 $\mu$ F, 50V, Elect.			
D506, D507	225087	SEL1323G	C207, C208	352784799	0.47 $\mu$ F, 50V, Elect.			
<b>Lamp</b>								
PL101	210064B	250mA, 6.3V	C211, C212	352741009	10 $\mu$ F, 16V, Elect.			
<b>Coils &amp; transformers</b>								
L001	233106 or 233088-1	NFA-3009 or NFA-3001	C213	352741019	100 $\mu$ F, 16V, Elect.			
L002	233178	NFRF-3015	C214	370133614	360pF $\pm$ 5%, 100V, APS			
L003	233232	NCH-1049	C216	352780339	3.3 $\mu$ F, 50V, Elect.			
L004	233090	NFO-3003	C217	352780229	2.2 $\mu$ F, 50V, Elect.			
L101	233148	NFIF-6010P	C218	352780109	1 $\mu$ F, 50V, Elect.			
L102	233149	NFIF-6010S	C501	352741009	10 $\mu$ F, 16V, Elect.			
L103	233105 or 233024	NCH-1005 or NCH-1501	C902	352754719	470 $\mu$ F, 25V, Elect.			
L151	232086	NMA-3035	C903	352742219	220 $\mu$ F, 16V, Elect.			
L153	232073	NMO-2008	C904	352751019	100 $\mu$ F, 25V, Elect.			
L155	232041	NIT-0509	<b>Resistors</b>					
L201	233236	NMC-6027	R215	5225015	N10HR10KBD, Semi-fixed			
<b>Ceramic filters</b>								
X001, X101	3010057 or	SFE-10.7MA5Z or	R501	441625604	56 $\Omega$ , 1W, Metal oxide film			
X102	3010003	SFE10.7MA	<b>Switches</b>					
X151	3010053	SFL-455B	S1	25035260	NPS-142-L224, AM/FM selector			
<b>Decoder</b>								
<b>Bracket</b>								
<b>Shielded plate</b>								
<b>Front end</b>								
<b>Screws</b>								
<b>3P+6FN, Pan head screw</b>								
<b>3STW+8BQ, Tapping screw</b>								

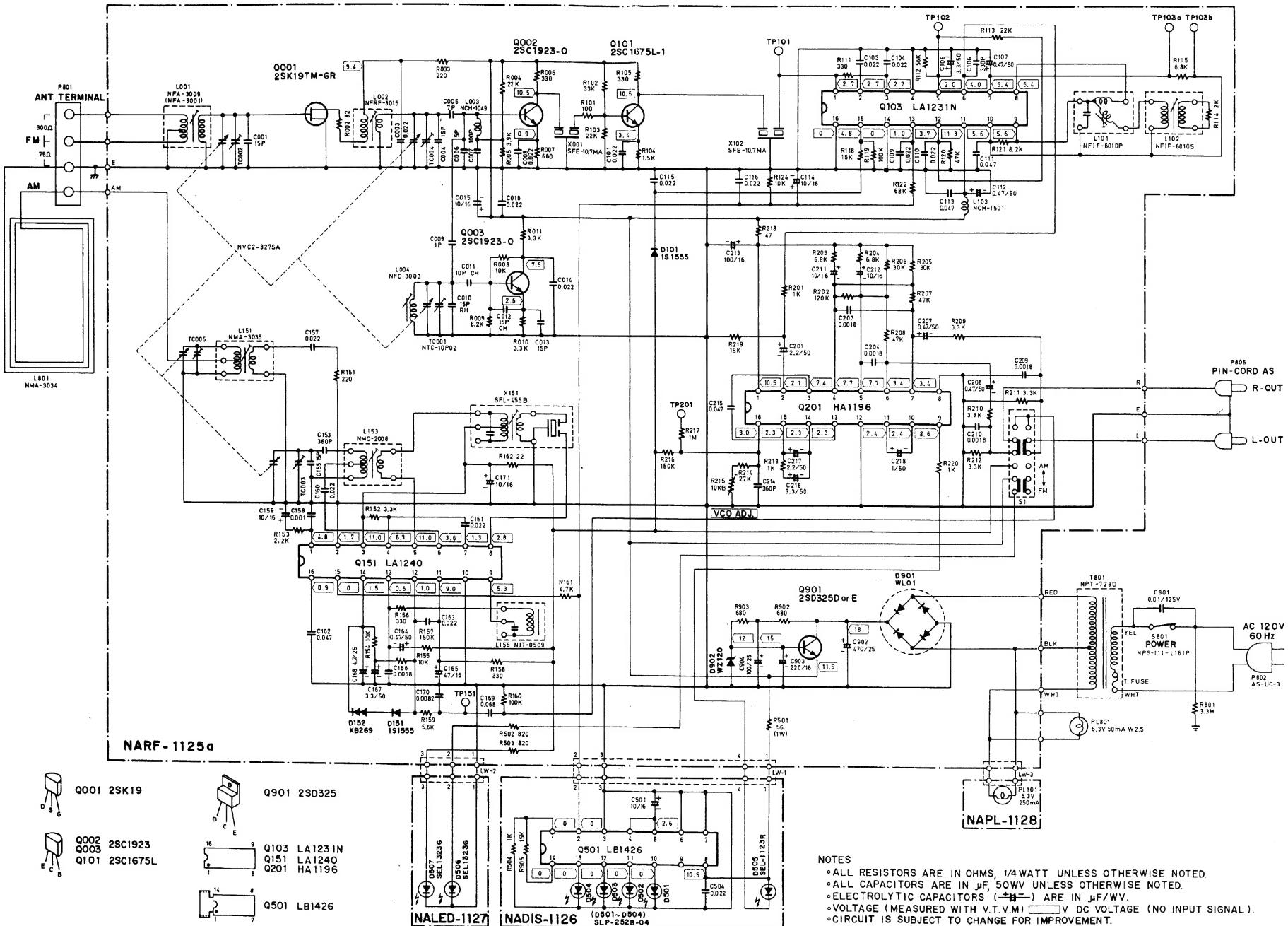
HA 1196 (MPX decoder)



LB1426 (Signal indicator drive)



## SCHEMATIC DIAGRAM D model



## NOTES

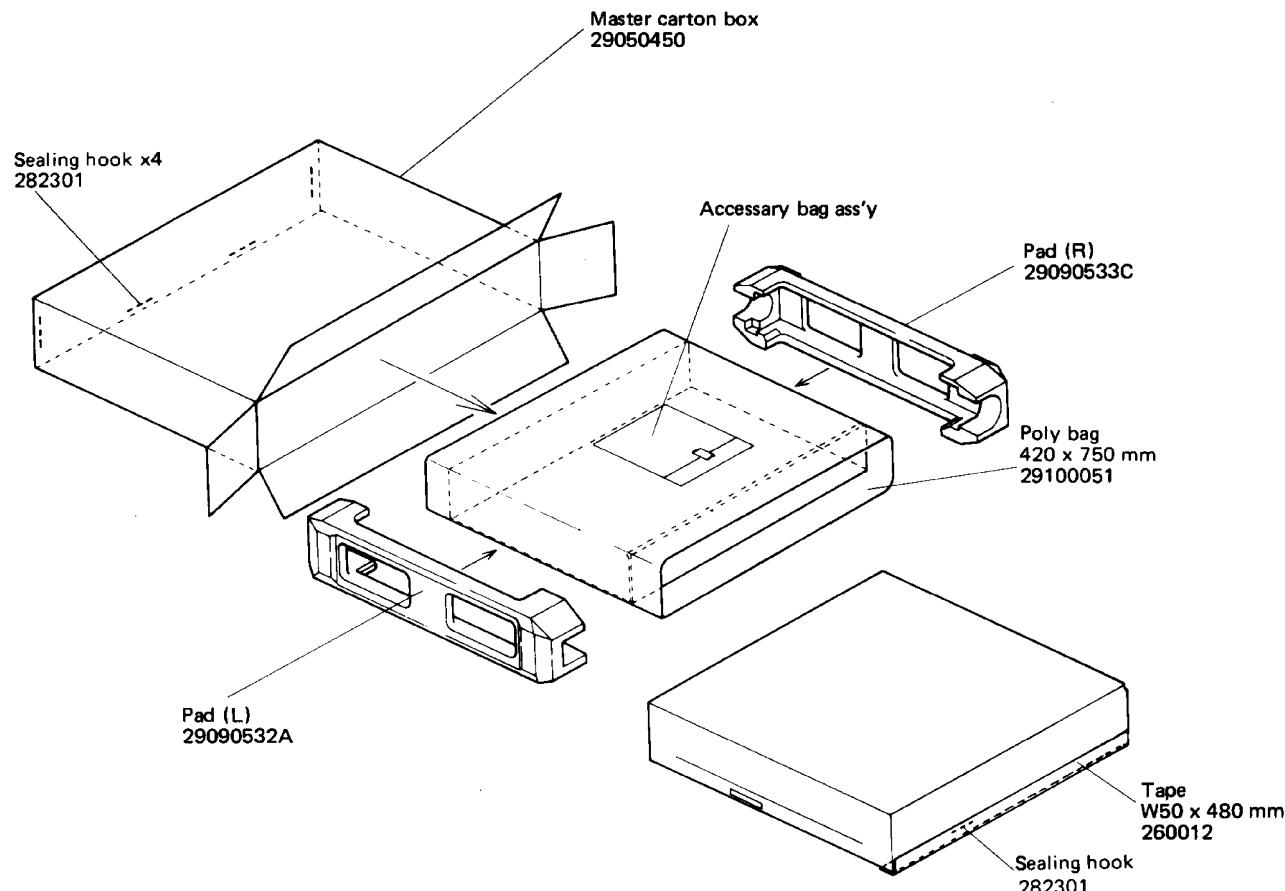
- ALL RESISTORS ARE IN OHMS, 1/4 WATT UNLESS OTHERWISE NOTED.
- ALL CAPACITORS ARE IN  $\mu$ F, 50V UNLESS OTHERWISE NOTED.
- ELECTROLYTIC CAPACITORS (  $\mu$  ) ARE IN  $\mu$ F/WV.
- VOLTAGE (MEASURED WITH V.T.V.M.)  DC VOLTAGE (NO INPUT SIGNAL).
- CIRCUIT IS SUBJECT TO CHANGE FOR IMPROVEMENT.

**ONKYO CORPORATION**

## PARTS LIST

SYMBOL NO.	PARTS NO.	DESCRIPTIONS	SYMBOL NO.	PARTS NO.	DESCRIPTIONS
A1	27110134A	Front bracket	P801b	25045088	F connector (G)
A2	27205026	Drive shaft	P802	253099A	AS-UC-3, Power supply cable (D)
A3	28165057A	Pointer	P802	253083	AS-CEE, Power supply cable (G/W)
	28140345	Cushion			Power supply cable (Q)
A4	27185002A	DP-16, Dial pulley	P802	253077	PN-B, Output cable
A5	27140501	Bracket, dial pulley	P804	2010039	Bracket, power switch
A6	801147A	Tapping screw	P805	27140502	Terminal (D)
A8	27200023	Dial drum	P806	223004	SR-3P-4, Strainrelief (D)
A9	27180044	Spring for A8	P807	270025	SR-4K-4, Strainrelief (G/W)
A10	273903	Stringing	P807	270280	SR-6W-1, Strainrelief (Q)
A12	27115045E	Side bracket, left side	P807	27300349	PL6.3V50mA2.5, Lamp, power
A13	27115088	Side bracket, right side	P808	270025	3.3MΩ, 1/2W, Solid resistor (D)
A14	27140403	Bracket, dial pulley	PL801	210119	NPS-111-L184P, Power switch
A16	27120304	Back panel (D)	R801	431523355	(D)
A16	27120305	Back panel (G)	S801	25035220	NPS-122-L156P, Power switch
A16	27120306	Back panel (W)	S801	25035192	(G)
A16	27120325	Back panel (Q)	S801	25035220	NPS-111-L-184P, Power switch
A17	27140444	Bracket, pc board	S801	25035268	(W)
A18	27190105	Antenna holder	S801	25035268	NPS-121-L233P, Power switch
A19	834130068	3TTS+6B, Tap screw	S801	230506	(Q)
A20	831130088	3TTW+8B, Tap screw (D)	T801	230507	NPT-723D, Power transformer
	834140108	4TTS+10B, Tap screw (G/W/Q)	T801	230508	(D)
A21	834130088	3TTS+8B, Tap screw	T801	230514	NPT-723G, Power transformer
A22	82113006	3P+6FN, Pan head screw	T801	13389525A	(G)
A23	87619014	W9x14F, Washer	T801	13392525B	NPT-723DG, Power transformer
A24	8631901	N-9F, Nut	T801	13390525C	(Q)
A26	834130088	3TTS+8B, Tap screw	U1	13389525A	NARF-1125a, AM/FM tuner
A31	28184104	Top cover	U1	13392525B	pc board ass'y (D)
A32	28140020	4x10x40, Cushion	U1	13390525C	NARF-1125b, AM/FM tuner
A33	834430068	3TTS+6B (BC), Tap screw	U2	13662526	pc board ass'y (G/Q)
A51	13389121	Front panel ass'y	U2	13662527	NARF-1125c, AM/FM tuner
A52	13389901	Dial plate ass'y	U4	13662528	pc board ass'y (W)
A53	27267109	Guide, power	S4	25065123	NADIS-1126, Signal indicator
A54	27267110	Guide, selector			pc board ass'y
A55	831130080	3TTW+8P, Tap screw			NALED-1127, AM/FM indicator
A61	27170093	Bottom board (D/G/Q)			pc board ass'y
A61	27170105	Bottom board (W)			NAPL-1128, Dial illumination
A62	27175011C	Leg			pc board ass'y
A63	831130088	3TTW+8B, Tap screw			NSS-1258P, Voltage selector
A64	28320542	Tuning knob			switch (W)
A65	28320541	Knob, selector			
A66	831130080	3TTW+8P, Tap screw			
C801	3500060	0.01μF, 125V, CS capacitor (D)			
C801	3500058	PME265MB510, IS capacitor (G/W)			
C801, C802	3500058	PME265MB510, IS capacitor (Q)			
C801a	27300080	Cover, capacitor (D)			
L801	232085	NMA-3034, AM loop antenna			
P801	25060035	NTM-4PRMC06, Antenna terminal			
					Note: (D): Only 120V model (G): Only 220V model (W): Only 120/220V model (Q): Only 240V model

## PACKING PROCEDURES



Accessory bag ass'y	U.S.A.	120V	West Germany	220V	120/220V
Model					
Instruction manual	29340510	29340510	29340511	29340511	29340511
FM antenna	292064A	292064A	292064A	292064A	292064A
Warranty card	29365006	—	29365005-3	—	—
Service station list	29358002	—	—	—	—
Conversion plug	—	—	—	—	25055040

### ONKYO CORPORATION

International Division: No. 24 Mori Bldg., 23-5, 3-chome, Nishi-Shinbashi, Minato-ku, Tokyo, Japan  
 Telex: 2423551 ONKYO J. Phone: 03-432-6981

### ONKYO U.S.A. CORPORATION

#### Eastern Office

42-07 20th Avenue, Long Island City, New York 11105, U.S.A. Phone: (212) 728-4639

#### Midwest Office

935 Sivert Drive, Wooddale, Illinois 60191, U.S.A. Phone: (312) 595-2970

C/O Damark Industries, Inc.

20520 Nordhoff Chatsworth, Cal. 91311, U.S.A. Phone: (213) 998-6501

### ONKYO DEUTSCHLAND GMBH, ELECTRONICS

8034 München-Germering, Industriestrasse 18, West Germany. Telex: 521726 Telefon: (089)-84-3071